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## PRESERVING FARM-DRESSED MEAT IN FREEZER STORAGE

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The rapid increase in the utilization of freezer storage by farmers to preserve home grown food supplies has developed a demand for technical information on that subject that many extension workers are not prepared to supply. The purpose of this paper is to summarize the facts that are available and to suggest problems on which more investigation, both scientific and practical, is needed.

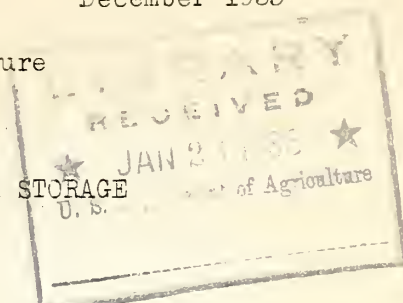
Historically, the expansion of the use of cold storage by farmers has proceeded through the winter harvesting of natural ice, the purchase of manufactured ice, the use of mechanical refrigerators, and finally the renting of commercial refrigerated space for curing meat or the temporary holding of other foods. Currently, is the nationwide development of the so-called "freezer lockers" where foods are frozen and held for periods of several months or even longer than a year. Certain companies have now built experimental household refrigerators with freezer storage for from 200 to 300 pounds of meat.

New Type of Middleman

These changes are but natural steps in the progressive task of bringing controlled temperatures nearer to our rural population. Convenience and the desire for better things have played a part in this development but a more potent influence has been an economic one. Top market prices for many perishables have been possible only where goods were handled properly at point of origin. As a result many producers now have cold-storage facilities in their own towns for handling eggs, milk, butter, fruit, vegetables, and meats. The widespread distribution of electric power, new developments of mechanical equipment, and improved cold-storage service have made the local use of these controlled temperatures by farmers not only possible but economical. The immediate problem is to supply the information that will make it possible for this new type of middleman, the sellers of low temperatures, to give the results that the eager buyers of that service need. The extension worker is also interested in the ways in which these new agencies and these new methods can be used to teach the lessons of sound production and utilization.

Freezer Lockers Widespread

The so-called "freezer lockers" have been built by the scores in the Pacific Northwest States. Numerous others are appearing in the Midwest, the South and other sections. The oldest commercial venture of this char-



acter reported to the writer was launched about ten years ago, but most of this new development has occurred within the last 5 years. Many of these lockers have been operated less than two years, many others less than one.

Batteries of lockers about 2 by 2 by 3 feet are provided in sub-freezing temperatures and rented on a yearly basis to individuals. From 50 to 2,000 families in the respective communities have availed themselves of this service to store their food supplies. Patrons are from among both town and country residents. In one small town in Washington State all but two families are using these lockers. Meats, poultry, game, fruits, vegetables, and butter are the principal products frozen. Ice cream and water for making ice are often included. Some plants have separate facilities for freezing fish.

All sizes of lockers, all kinds of service, many levels of temperature, all grades of product and all methods of preparing and packaging the products are in evidence. This lack of uniformity in procedure contrasts with the almost unanimous approval indicated by the renters of the lockers and by the capacity business that most plants are doing at a rental charge averaging from \$7 to \$10 a year. Numerous families now preserve but little food by canning, particularly nonacid products such as beans, peas, and meats.

#### Effects of Freezing

The preserving effects of subfreezing temperatures include (1) the killing or stopping of the development of molds, yeasts and bacteria, (2) the inactivation of the enzymes, thus delaying autolysis or self digestion, and (3) the retarding of chemical changes such as dehydration and oxidation. Although there is little microbial action under commercial freezer storage, the development of undesirable textures, colors, odors, and flavors is common. These changes are attributed to continuing enzymitic action, evaporation of the surface ice, etc. More information is needed as to the most favorable conditions and methods for handling the various food products. However, the following procedures are reported to give the best results.

Zero F. is generally accepted as the preferred temperature for the "sharp" freezing and storage of foods. This should not be confused with the subzero temperatures used in "quick" freezing. Although zero is the recommended level for sharp freezing, 10 or 12° above zero is often used and will probably be satisfactory if the lower one is not practical. Eighteen or 20° is often used but is probably too high. There seems to be a temperature level around 15° above which results are often unsatisfactory. Much variation in temperature is considered undesirable. A relative humidity around 85 percent is generally recommended.

#### Preparation of Products

Meat should be chilled and cut into family-size pieces before being frozen. Beef and lamb will be improved if hung or aged at temperatures between 33° and 38° for about a week before being cut and frozen, as they may not ripen sufficiently while held at the low freezer temperatures.



All cuts should be well wrapped in tough moisture-proof parchment paper, preferably before freezing. Cheap oiled paper or ordinary wrapping paper will not prevent undesirable drying. The wrapped fresh meat should be spread so that it will freeze quickly. When the packages of fresh, chilled meat are piled together in the locker it is often several days before the center of the pack reaches the desired temperature. Some spoilage and some off-flavors have been reported when the meat was piled to freeze.

Well-fattened beef and lamb appear to stand freezer storage better than the thinner meat. Fresh pork, under the present methods of wrapping, does not give the satisfaction obtained from beef and lamb when stored for several months. Smoked pork is often frozen to prevent mold and infestation by insects. The freezing of this product is often unnecessary but many do it and report favorably on it. Sausage is usually ground and frozen without seasoning. The fresh, aromatic spices are added after thawing.

Thawing the frozen cuts in a household refrigerator is practiced wherever such equipment is available. Otherwise prompt cooking of the thawed product is considered essential.

The managers of some freezer lockers hire a custom butcher who solicits business and goes out and dresses animals on the farm, bringing the meat back to the plant to chill. All the plants observed will cut and wrap the meat for a charge averaging about 1 1/4 cents per pound. One cooperative plant in Oregon charges only 3/4 cent. Almost all the plants purchase dressed carcasses and will wholesale quarters or entire carcasses to customers. This is particularly true where a large number of the patrons live in town.

### Community Organizations

Many freezer-locker establishments operate retail meat or meat-and-grocery stores in addition to their storage business. In fact many retail meat dealers in small or even medium-sized towns have pioneered the locker business to add that trade to the reduced volume going over the retail counter. Community organizations such as the Farmers' Union or the Grange have often started cooperative lockers or helped the local cold storage plant or meat dealer to finance his new installation.

Inspection of the meat handled through these freezer lockers or of the manner in which they are constructed and operated is largely absent. Already, however, there is definite talk about inspection. The community effort to dress, cut and use locally grown meat would seem to make practical some sort of community inspection service. Perhaps these freezers will advance the day when efficient inspection can be available at moderate cost for farm or country dressed meat.

Methods for preparing, packaging, and freezing fruits and vegetables have been worked out by the Frozen Pack Laboratory of the Federal Bureau of Chemistry and Soils and those recommendations can be obtained through that Bureau. In this connection it is of interest that one whole room in a Washington State freezer has been rented to a vegetarian sect.

### Value to Extension Worker

In fruits, vegetables, egg meats, and poultry, as well as in meats it is true that the quality of the thawed product depends largely on the quality of the fresh material that was frozen. Herein lies the chance of the extension worker to hammer home the value of good production practice. The cuts from a plain beef carcass will last a family through an exasperating series of tough steaks and dry roasts. If the county agent can engineer one change to the delicacies from good beef, the demonstration of quality and the value of good breeding and feeding is usually complete. The man who fills a locker and a half with the cuts of a good yearling steer can look with pride as he sees the plain yearling of his neighbor fill but a single locker.

Most meat cutters at these plants identify each 4 or 6 or 8-pound cut by writing the name of that cut on the wrapper. They use the terms "steak" or "roast" or "pot roast" or "boil". Many include the name of the cut as well, such as "T bone" or "rib" or "chuck". Here is a chance to teach cuts of meat in relation to cooking method. Here is also a chance for the cutter, with some instruction, to give quality meat a distinction and value that it rarely receives in its home town. Every chuck rib from quality cattle that is labeled "roast" and every prime rib from a plain hard muscled beef that is marked "pot roast" drives home a lesson that animal husbandmen have been trying to teach for years.

Freezer lockers have their uses and abuses. Operation and procedures are still in a state of flux. Credit a majority of the present managers with a desire to know more about their job and how to give best results. Debit our extension program if it doesn't include this new agency among the possibilities for serving rural communities.